REMARKS

Reconsideration and re-examination are hereby requested.

Claims 1-23 stand rejected as being anticipated by Martin et al, U. S. Patent No. 5,214,768).

Before discussing the claims and how they distinguish over the cited art. Perhaps it might be helpful to review features of applicant's invention.

As described in the patent application, referring now to FIG. 2, a data storage system 100 is shown for transferring data between a host computer/server 120 and a bank of disk drives 140 through a system interface 160. The system interface 160 includes: a plurality of, here 32 front-end directors 180_1-180_{32} coupled to the host computer/server 120 via ports-123_{32}; a plurality of back-end directors 200_1-200_{32} coupled to the bank of disk drives 140 via ports 123_{33}-123_{64}; a data transfer section 240, having a global cache memory 220, coupled to the plurality of front-end directors 180_1-180_{16} and the back-end directors 200_1-200_{16}; <u>and a messaging network 260,</u> operative independently of the data transfer section 240, coupled to the plurality of front-end directors 180_1-180_{32} and the plurality of back-end directors 200_1-200_{32}, as shown. The front-end and back-end directors 180_1-180_{32}, 200_1-200_{32} control data transfer between the host computer/server 120 and the bank of disk drives 140 <u>***in response to messages passing between the directors 180_1-180_{32}, 200_1-200_{32} through the messaging network 260***</u>. The messages facilitate the data transfer between host computer/server 120 and the bank of disk drives 140 with such data passing through the global cache memory 220 via the data transfer section 240.

<u>More particularly, in the case of the front-end directors 180_1-180_{32}, the data passes between the host computer to the global cache memory 220 through the data pipe 316 in the front-end directors 180_1-180_{32} and the messages pass through the message engine/CPU controller 314 in such front-end directors 180_1-180_{32}</u>. In the case of the back-end directors 200_1-200_{32} the data passes between the back-end directors 200_1-200_{32} and the bank of disk

drives 140 and the global cache memory 220 through the data pipe 316 in the back-end directors 200_1-200_{32} and again the messages pass through the message engine/CPU controller 314 in such back-end director 200_1-200_{32}.

With such an arrangement, the cache memory 220 in the data transfer section 240 is not burdened with the task of transferring the director messaging. Rather the messaging network 260 operates independent of the data transfer section 240 thereby increasing the operating bandwidth of the system interface 160.

Referring now to FIG. 5, the system interface 160 is shown to include the director boards 190_1.190_8, 210_1-210_8 and the global cache memory 220, plugged into the backplane 302 and the disk drives 141_1-141_{32} in the bank of disk drives along with the host computer 120 also plugged into the backplane 302 via I/O adapter boards, not shown. The message network 260 (FIG. 2) includes the message network boards 304_1 and 304_2. Each one of the message network boards 304_1 and 304_2 is identical in construction. A pair of message network boards 304_1 and 304_2 is used for redundancy and for message load balancing. Thus, each message network board 304_1, 304_2, includes a controller 306, (i.e., an initialization and diagnostic processor comprising a CPU, system controller interface and memory, as shown in ***FIG. 6 for one of the message network boards 304_1, 304_2 here board 304_1) and a crossbar switch section 308 (e.g., a switching fabric made up of here four switches 308_1-308_4).***

Referring now to the rejection, the Examiner indicates that the claimed message network is element 40 in Martin et al. Referring to Martin et al, column 5, beginning at line 63 and continuing to column 6, line 15:

> The control subsystem 40 provides control for the allocation and de-allocation of common resources for the mass storage library system. When an interface tape server 14, 16 or 18 or the interface disk server computer 19 receives a command to read or write data, it first requests resources from the control subsystem 40. Computer 40 will initialize and position the appropriate resources and informs the requesting IFS when the resources are available. Control of the recorder resources is then passed to the requesting IFS. Once the operation is complete, the controlling IFS informs control computer 40 that the operation is complete and the control computer 40 de-allocates those resources. Thus, the control computer 40 communicates with the IFS tape

> servers 14, 16 and 18 and the IFS disk server 19 through line 58 which could be any one of a number of commercially available networks. It also communicates with the switch subsystem 42 through line 60, the drive subsystem 44 through line 62 and the storage/transport subsystem 56 through line 64. These lines 58, 60, 62 and 64 are not necessarily independent.

Also, referring to Martin et al., column 9, lines 28-44:

> The CNS 40 includes a control processor 114, a console processor 116, a high speed printer (not shown), and a media label printer 118. The control processor 114 and the console processor 116 are Sun 3 Series 200 workstations. They share a disk pool and provide immediate mutual redundancy. Both processors are connected to the line printer (not shown) that is capable of printing at least 300 lines per minute. Both processors are also connected to a media label printer 118 through the MSL control LAN 95. The media label printer 118 produces machine readable and human readable media labels. This configuration enables the CNS 40 to tolerate the failure of a single disk drive with no degradation in performance or throughput. In the event of a processor failure, either processor can be configured to perform the entire processing function.

Referring now to the claims, it is noted that the claims point out that messages pass through the message network. In the system of Martin et al. messages do not pass through element 40.

More particularly, referring to the independent claims:

Claims 1, 8 point out that "wherein the first and second directors control data transfer between the first directors and the second directors in response to ***messages passing* between the first directors and the second directors *through the messaging network*** to facilitate data transfer between first directors and the second directors with such data passing through the cache memory in the data transfer section" (emphasis ours)

Claim 15 points out that" transferring messages through a messaging network" (emphasis ours)

Claims 16 and 17 point out that:" messages passing between the first directors and the second directors through a messaging network" (emphasis ours)

New claims have been drafted and point out in similar manner that messages pass through the message network. As noted above, such feature is not described in Martin et al.

Further, a new claim 24 has been added. Such claim is dependent on claim 1 and points out that the "messaging network comprises a switch network having a plurality of ports, each one of the ports being coupled to a corresponding one of the plurality of first and second directors." It is respectfully submitted that such a switch network is not described in Martin et al. This feature is also pointed out in new claims: 25, 27, 29, 30, 33, 37 and 55. Claims 43, 45, 47, 48, and 51 point out that: "a messaging network comprising a switch network having a plurality of ports, each one of the ports being coupled to a corresponding one of the plurality of directors".

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Respectfully submitted,

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Date

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